WE CLAIM:

1. A printing device comprising printing elements, each printing element comprising:

a conductive element which is addressable by a memory and mapped to at least one portion of a digital image, the conductive element being switchable between at least a first and second state, the first state being attracted to ink and the second state not.

2. The printing device of claim 1 wherein the conductive element is a conductive pad located at the end of a via.

3. The printing device of claim 1 wherein the memory is a semiconductor memory.

4. The printing device of claim 1 wherein a digital or an analog signal is used to drive the digital printing element.

5. The printing device of claim 1 wherein an array of printing elements are located on a cylindrical printing drum.

6. The printing device of claim 1 wherein an array of printing elements are located on a flat printing plate.

7. The printing device of claim 1 further comprising a insulated conductive layer, the insulated conductive layer comprising a insulated material having a plurality of conductive vias therethrough, each of the vias connected to the conductive element.

8. The printing device of claim 1 wherein individual printing elements are hard wired to at least one memory chip or alternatively to a multiplicity of memory chips.

9. The printing device as claimed in claim 1 wherein each printing element may or may not be coupled to a memory location.

10. The printing device of claim 1 wherein the image to be printed is divided into a plurality of smaller portions and each portion is mapped to a printing element which is addressed by the memory.

11. The printing device of claim 1 wherein the memory is coupled to a flexible circuit directly such that the printing elements are directly attached to the individual memory cells on the chip.

12. The printing device of claim 1 wherein an individual memory cell in the memory is coupled to a flexible circuit, the flexible circuit having additional circuitry designed to enable the storage of a digital binary signal and the flexible circuitry having the capability to conform to a rectangular surface.

13. The printing device of claim 1 wherein the individual cells in the memory are coupled to a flexible circuit, the flexible circuit having additional circuitry designed on it to enable the storage of a digital or an analog binary signal, and the flexible circuitry having the capability to conform to a cylindrical surface.

14. The printing device of claim 1 wherein individual printing elements are hard wired to an integrated circuit chip or a multiplicity of chips using single or multilayer circuitry in such a manner as to provide a digital or an analog binary signal to the printing elements.

15. The printing device of claim 1 wherein individual printing elements are hard wired to a chip or a multiplicity of chips using single or multilayer circuitry and the printing elements are distributed on a flexible insulative medium.

16. The printing device of claim 1 wherein individual printing elements are hard wired to a chip or a multiplicity of chips using single or multilayer circuitry and have the printing elements distributed on a rigid insulative medium.

17. A digital printing method comprising:

addressing charged ink or (toner) in a solid or liquid form to a location on a digitally driven data point or a printing element location using digital signals to drive the printing elements; and

digitally decomposing an image (monochrome or color) and spatially mapping the image to the individual printing elements using integrated circuitry.

18. The method of digital printing of claim 17 wherein an array of chips are interconnected to each other and to a common bus, and are coupled to the underlying printing elements.

19. The digital printing method of claim 17 wherein a flexible circuit is used.

20. The digital printing method of claim 17 wherein an inflexible circuit is used.

21. The digital printing method of claim 17 wherein an flexible circuit is used.

22. The digital printing method of claim 17 using electrostatic principles of charge attraction from semiconductor based memory devices without the use of photoconductor drums or other charge imparting devices such as scorotrons and or corotrons or other laser scanning equipment or equipment that does not use LED arrays.

23. The printing method of claim 17 wherein the printing method is a non-lithographic technique of printing using electrostatic principles of charge attraction without the use of intervening printing medium such as printing plates

24. The printing method of claim 17 wherein the image is printed using a charged ink such as a toner (solid or liquid) whereby the ink attracting location has a permanent charge in it sufficient to attract the charged ink until reset by a digital signal.

25. The printing method of claim 17 wherein color images are printed by a subtractive scheme wherein colored (Cyan, Magenta, Yellow and Black) ink is applied successively to media.

26. The printing method of claim 17 wherein color images are printed by an additive scheme by addressing colored (red, green, blue) inks to media.

27. The printing method of claim 17 wherein images are printed on media such as paper or plastics or any other printable surface such as paper or cardboard or wood based surfaces, flexible and inflexible plastics and flexible or inflexible metallic media.

28. The printing device of claim 1 wherein digital data is transmitted to the cylindrical or planar memory configuration using wireless chip control circuitry along with the printing element driver integrated circuit chip.

29. A method of digital printing, the method comprising the steps of:

providing a digital printing device, either planar or cylindrical in configuration, the printing device comprising an insulated conductive layer and a semiconductor memory, the insulated conductive layer comprising an insulated material having a plurality of holes(micro-vias) therethrough, each of the micro-vias filled with a conductive material, and each micro-via being terminated at each end with a conductive pad, and the semiconductor memory array comprising an array of individual memory cells, each of the memory cells capable of holding a charge and being superimposed onto the insulated conductive layer;

addressing each point of the semiconductor memory and mapping an image to the semiconductor array; and

using a digital signal to assign an appropriate charge to each memory cell; and

addressing charged ink in a solid or liquid form to the printing drum, thereby printing an image.

30. A method of digital printing, the method comprising the steps of:

providing a printing device, the printing device comprising a plurality of printing elements, each printing element comprising a conductive element which is addressable by a memory

mapping at least one portion of a digital image to the memory,

and assigning the conductive element one of at least a first and second state, the first state being attracted to ink and the second state not.

31. The method of claim 29 wherein a monochrome (black and white) or (gray scale) digitally scanned image is directly loaded onto the memory locations in a binary state corresponding to either the presence or absence of charge respectively at the printing element location.

32. The method of claim 29 wherein a colored image is digitally decomposed into its original subtractive color components namely cyan, magenta, yellow and black and additional colors or shading are directly loaded into individual cylinders or planar memory locations in the case of a flat memory structure respectively for each color in a binary state corresponding to either the presence or absence of charge respectively at the printing element location.

33. The method of claim 29 wherein printing elements are distributed on an insulated medium such as plastics using semiconductor based integrated circuitry.

34. The method of claim 29 wherein printing elements are distributed on a rectangular insulated medium.

35. The method of claim 29 wherein ink is transferred from the printing element surface to an offset cylinder.

36. The method of claim 29 wherein the printing element driver chips are staggered on two boards opposing each other to provide continuous coverage to drive printing elements on a rectangular surface.

37. The method of claim 36 wherein an offset cylinder is coupled to the staggered printing element drivers to transfer the ink from the printing elements to the offset cylinder.

38. The method claim 29 wherein the printing elements are distributed on a cylindrical insulated medium.

39. The method of claim 29 wherein the printing elements are connected to a flexible circuitry to reduce wiring density.

40. The method claim 29 wherein the memory storage and connecting elements are distributed between the printing element driver chips and the flexible circuitry that holds the printing elements.

41. The method of claim 29 wherein the number of dots per inch of printed matter is regulated by varying the space in between the individual printing elements that are energized in such a manner that the number of printing elements per unit area can be selectively addressed to produce digital half-toning effects.

42. The method of claim 29 wherein the number of dots per inch of printed matter is regulated by varying the space in between the individual printing elements that are energized in such a manner that the number of printing elements per unit area can be selectively addressed to produce monochrome digital half-toning effects while printing with one color ink.

43. The method of claim 29 wherein the number of dots per inch of printed matter is regulated by varying the space in between the individual printing elements on discrete cylinders or on planar printing elements that are energized in such a manner that the number of printing elements per unit area can be selectively addressed to produce color digital half-toning in discrete cylinders or planar printing element effects while printing with color ink.

44. The method of claim 29 further comprising the step of coupling an automated scanner to the end of the print cycle for error correction and proof reading of the printed material.

45. The method of claim 45 wherein the automated scanner is coupled to the end of the printer for registration and alignment of the inks in the printed medium.